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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,160	12/01/2005	Christopher John Harris	05375/HG	3537

1933 7590 12/13/2006

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EXAMINER

PARSA, JAFAR F

ART UNIT

PAPER NUMBER

1621

DATE MAILED: 12/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/540,160

Applicant(s)

HARRIS ET AL.

Examiner

Jafar Parsa

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 6/21/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

The information disclosure statement filed 6/21/2005 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 6, 7, 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Nielsen et al (Nucleic acids Research (1987), 15 (8), 3626).

Nielsen teaches a process for preparing 2-cyanoethyl N,N,N',N'-tetraisopropylphosphorodiamidite, the process comprising to a solution of phosphorus trihalide in dry CH<sub>3</sub>CN is added dropwise 3-hydroxypropionitrile. The mixture is stirred for 0.5 Hr, and solvent and excess of PCl<sub>3</sub> removed in vacuo on a rotary evaporator. The oily residue which is pure Cl<sub>2</sub>POCH<sub>2</sub>CH<sub>2</sub>CN is dissolved in dry diethyl ether, and dry diisopropylamine added at 10<sup>0</sup>C with stirring. The aqueous phase is extracted with CH<sub>2</sub>Cl<sub>2</sub> and the combined organic phase dried and evaporated to an oil. See page 3626.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nielsen et al (Nucleic acids Research (1987), 15 (8), 3626) in view of Shamblee et al (US 2003/0236233 A1).

Applicants' claimed invention is directed to a method of phosphorodiamidite production which method comprises the steps of reacting a phosphorus trihalide with a dialkylamine in a polar solvent to form an intermediate compound and subsequently reacting the intermediate compound with a hydroxyalkyl compound and a dialkyl amine, in the presence of a non-polar co-solvent. The process further comprises that the phosphorus trihalide is phosphorus tribromide and dialkyl amine is selected from the group comprising of dimethyl amine, diethylamine, di-n-propylamine, di-n-butylamine,

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di-isobutylamine or ditert-butylamine and the ratio of polar solvent to non-polar solvent is 1:1.

Nielsen teaches a process for preparing 2-cyanoethyl N,N,N',N'-tetraisopropylphosphorodiamidite, the process comprising to a solution of phosphorus trihalide in dry  $\text{CH}_3\text{CN}$  is added dropwise 3-hydroxypropionitrile. The mixture is stirred for 0.5 Hr, and solvent and excess of  $\text{PCl}_3$  removed in vacuo on a rotary evaporator. The oily residue which is pure  $\text{Cl}_2\text{POCH}_2\text{CH}_2\text{CN}$  is dissolved in dry diethyl ether, and dry diisopropylamine added at  $10^\circ\text{C}$  with stirring. The aqueous phase is extracted with  $\text{CH}_2\text{Cl}_2$  and the combined organic phase dried and evaporated to an oil. See page 3626.

With respect to claim 3, Nielsen teaches phosphorus trichalide is used for preparing phosphorodiamidite. Phosphorus tribromide is encompassed by a disclosing phosphorus trihalide.

With respect to claim 5 Nielsen teaches using a dialkyl amine such as, diisopropylamine in the process for preparing phosphordiamidite. However, Shamblee in a process for making phosphordiamidite teaches that the preferred alkyl groups for the dialkylamine have from 1 to 6 carbon atoms, which encompasses the dialkylamine listed in claim 5. See Shamblee page 1, paragraph 0015. Shamblee teaches that the phosphorus trihalide with a cyano-containing reagent to form cyano alkylphosphordihalidite. The cyano-containing reagent is selected from the group containing of a cycloalkano. The alkanol group of the cyanoalkanol is a C1-C6 alkanol. See paragraph 0012-0013. Shamblee also teaches that the preferred solvents include tetrahydrocuran, ether, toluene, hexane and the like and mixture thereof and it is well-within the routine skill in the art to select the sufficient amount of solvent in order to dissolve residual amine hydrohalide byproduct. See paragraph 00.18.

In view of Nielsen's teaching coupled with Shamblee it would have been obvious to one having ordinary skill in the art at the time the invention was made to modified the process of Nielsen by including using various dialkylamine and hydroxyalkyl, in order to obtain cyanoalkyl tetraalkylphosphordiamidites free of amine hydrohalide with improved storage stability as suggested by Shamblee et al.

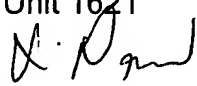
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jafar Parsa whose telephone number is (571)272-0643. The examiner can normally be reached on 8 a.m.-4:30 p.m. (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman Page can be reached on 571-272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JP

December 4, 2006

Jafar Parsa  
Primary Examiner  
Art Unit 1621  
  
**J. PARSA**  
**PRIMARY EXAMINER**